Beale, L.H.
The Stomach medically and morally considered

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THE STOMACH

MEDICALLY AND MORALLY CONSIDERED.

Lectures

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BY

LIONEL JOHN BEALE, M.R.C.S., F.E.S., F.R.S.L.,

MEDICAL OFFICER OF HEALTH, ST. MARTIN-IN-THE-FIELDS.

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PREFACE.

In publishing these lectures, I have fulfilled the wish of several who heard them delivered, and expressed the opinion that having derived useful hints for the improvement of their health, that a larger diffusion of such instruction might be beneficial. I have myself not the smallest doubt, that if the principles advocated in these lectures could be carried out fully, they would tend to the increase of health and happiness. Without good health we cannot enjoy either the pleasures of body or mind, we cannot fulfil the great objects of our being—the acquisition of knowledge, the search after the truths, the goodness, the beauty of God's works, and that advancement of our mental and moral powers which must be the true object of human life. We are too apt to

consider success in life to have reference to worldly success, to the acquisition of wealth and position; very desirable things no doubt, but which do not bear comparison with that success in the enjoyment of sound health, and in tuning our minds to wisdom, in disciplining our animal nature, in repressing appetite and passion, and elevating our mental and moral nature to a just conception of all the laws of the Creator in things around us and within us. Perhaps the real object of human existence is to acquire a full knowledge of the things within us, of those powers which God has implanted in every human soul, and which the experience of life ought to develop to their fullest possible extent. Experience is but another word for education, and the education of a wise man never ceases until death shall emancipate his soul from the difficulties, the ignorances, the blindnesses connected with the earthly career of the most elevated of our fellow-beings. Real success in life may therefore be adjudged to those who have succeeded in elevating their souls above the ordinary pursuits and pleasures of our very transitory

existence; for should we by good management keep up our health of mind and body to the latest period, yet after all our care, how short is the longest life—even when we extend our existence to seventy, eighty, or even ninety years—how small is the real difference.

That life may be extended even to one hundred years we have good evidence, and that there have been many cases of such extended existence where body and mind have both retained sufficient powers for healthy enjoyment, must be known to all. In establishing a sound constitution, our object should be to reach age, if such should be our lot, with that undiminished vigour which constitutes the most desirable condition of mature life, where all the powers of mind and body having been judiciously developed and advanced, we can carry such powers beyond middle life into what has been considered old age. Most of us have known old people who have retained all the feelings, views, and rational enjoyments of maturity, who can still take an interest in the affairs of life, and who still retain those hopes and desires for human advancement, the

general improvement, and continued civilization of all classes of their fellow-creatures, which the best men of all countries and of all creeds have ever hoped for.

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THE STOMACH MEDICALLY AND MORALLY CONSIDERED.

THE object of these Lectures is to draw your attention to the very important offices performed by the stomach, and the great evils resulting from its mismanagement. Its influence may be considered, 1, as a cause of disease; 2, in the continuance of disease; 3, in the cure of disease; 4, in the prevention of disease. In various ways the stomach may operate in causing disease, this will be fully discussed as we proceed. In the continuance of disease, in keeping up mischief already in the system, very much depends on the way we manage it; a wisely regulated system of diet will alone arrest disease, and an unwise system of allowing the stomach to indulge in an unnecessary amount of food, or food of an

objectionable nature will have the effect of thwarting all measures for the cure of disease, and too often are the means of aggravating it.

As an adjunct to the cure of disease nothing is of so much importance as a regulation of the action of the stomach in regard to the quantity and quality of the diet. It is in vain to attempt to cure disease while stomach indulgences are persisted in, and the difficulty of abandoning such old habits too often renders disease incurable. But it is in the prevention of disease that I would call your attention to the necessity of learning something about the process of digestion and the reparation of our bodily frame by new and healthy materials. The only way of keeping the blood supplied with sound materials for maintaining the health and strength of the body, is to make ourselves acquainted with the leading facts in relation to digestion, and I hope to show clearly how much it is the interest and within the power of all who regard health and strength as among the blessings of life, to learn how best to manage this most important part of our frame.

The process of digestion we are all more or

less acquainted with; many of us from personal experience know some of the difficulties resulting from imperfect or depraved action of the digestive organs; but there are not many who know, or at least appear to know, how much the processes of digestion are under our own control. There is nothing which contributes so much to our daily comfort, to the serenity of our temper, the vigour of our body, and also of our mind, as good digestion. The process of blood making begins in the stomach; without a healthy condition of the blood, the brain and nervous system cannot distribute to the various organs of the body that power upon the due action of which every organ is dependant, and without which we become miserable invalids. The power we possess of regulating our health by learning how best to regulate the supplies of food, &c., is incredible to all who remain ignorant of the importance of due attention to our digestive organs: and the enormous influence in the prevention and cure of disease effected by vigilance over the quantity and quality of the food with which we supply the stomach.

The object of digestion is to convert the crude supplies of the stomach into the materials for blood making, unless these materials be of a nature calculated to be converted into healthy blood, the whole constitution must suffer. People go on for years complaining of the miseries they endure from bad health, adopt every remedy, every quackery suggested, go to all sorts of places for the recovery of health without success, when due attention to the supplies of the stomach would restore health without any other treatment. It is true that to effect such changes as can be accomplished by diet alone requires self-denial, patience and perseverance, not often possessed, but of the fact that bad health may be converted into good health by simply attending to the kind of food we take, is unquestionable.

In the cure of disease as well as in the production of disease, the stomach is a most important agent: whether we attack disease by diet or by drugs, this organ is the medium through which we introduce our remedies. How should disease be cured? is a most important question, and upon its solution depends

the future welfare of all who are obliged to submit to medical treatment, for it must be obvious that so delicate an organ as the stomach may be irreparably injured by the very remedies taken to cure a disease in some other part. Such considerations lead to other important questions as to how far disease is under the influence of the multifarious substances which have obtained reputation for the cure of disease. That we have a few specifics which cure certain disordered actions, such as quinine, sulphur, iodine, &c., is unquestionable: that we also possess a few special things which influence the action of many of our organs, such as opium, mercury, chloroform, is also unquestionable; but that for every disease there is a specific remedy is one of the errors which has, and still prevents the advancement of the science of medicine to that position it ought to hold. So long as the public base their estimation of medical men, on their supposed knowledge of specifics for the cure of every diseased action, so long will the practice of physic remain in a very unsatisfactory state. Medicine will never take its proper position

while the public continue to hunt after special remedies and patronize every quackery, patent medicine, and impudent pretension offered them by the various kinds of medical advertisements which disgrace the columns of our periodicals.

I may here allude to the deterioration in the health of children, and sometimes to early deaths among them, caused by the administration of some nostrum for every little disturbance of health. No greater mistake prevails than that for every disordered action of any of our organs we must fly to the medicine chest for a remedy. It cannot be too often repeated that the cure of disordered action in the living body is provided for within the body itself. If we wound a limb whether in a vegetable or an animal, a repairing process from within instantly begins: cut away a portion of the bark of a tree and in a few weeks you will find the wound healed, the vessels of the part throwing out materials which fill up the gap and present a new surface to the air. So it is in the animal body, if an animal breaks a limb, a healing process takes place by which the fracture is

reunited: so in disease, what the old physicians called the *vis medicatrix naturæ*—the internal remedial power in all living creatures to counteract all external, offensive, or destructive influences, is instantly called into action to counteract disease or to repair injury. The duty of the patient and of his medical adviser is to aid and assist the *vis medicatrix naturæ*, the internal healing power, and to take care that any remedy used may not oppose rather than assist the reparative process. It will thus be apparent, that ignorance of the way in which disease is cured, may counteract the efforts of nature from within, and instead of helping to cure, may help largely to establish diseased action and even to destroy life.

My duties as Officer of Health lead me to suggest remedies for bad drainage, bad ventilation, ill-constructed over-crowded dwellings: the injurious effects of dirty habits and that neglect of bathing and attention to the skin, so essential to health; but I am sure that with all that can be done on these important subjects, we shall not gain our point of properly improving the health and strength of our people,

unless we can induce them to acquire that knowledge of the sources of health and life, which the processes of digestion alone unfold. Of these processes the first and most important is effected by the stomach, and it must be obvious that if we only knew how to act we could regulate this organ by giving or denying it such things as our acquired knowledge approved or disapproved of.

What should be the great objects of life and what are our special duties in our passage through this struggling world? have been subjects of controversy since the world began. Whether we should seek to pass away the time pleasantly, whether we should be always searching after what is called happiness, or whether the perfectibility of our nature and the progress of the soul in truth and goodness; whatever may be the object of life, even if it be the mere gathering together of earthly possessions, certain it is that neither the highest nor the lowest of these pursuits can be effectually carried on unless we are in health. Now we cannot enjoy a day's freedom from ill health, unless we acquire a full control over our stomach, unless we learn how

to manage, what we should administer to its wants; the kinds, quantities, and qualities, of the articles with which we supply it, and the kind of agency with which the organ itself deals with the materials supplied to it. Therefore I feel certain that if you will go with me in the argument, you will agree that the most important preliminary duty of life is to learn how to deal with the stomach. Without such knowledge we cannot command health, and without health we cannot devote our mind and energies to the acquisition of any of the blessings of life, whether we consider such blessings to be of a material or of a spiritual kind. In our present stage of existence, our spiritual part is dependant on the action of our brain and nerves; these delicate organs are more easily put out of order than any part of us, and they are most intimately dependant on the state of the blood; now the primary elements of the blood being elaborated by the stomach it follows that if we do not study its mode of action, the highest elements of our nature, our senses and sensibilities, our highest aspirations, our love for the true, the good, and the beau-

tiful, our power of carrying the mind from the present life into the future; all are jeopardized if we are frequent sufferers from indigestion, or other stomach derangements.

We should ever bear in mind that the whole welfare of life depends on the state of the blood, on the healthy condition of that vital fluid, on the due admixture of its component parts; and that it should circulate through the body none but particles essential to the well-being of the whole body, is alone consistent with the enjoyment of health. Rheumatism, gout, and many other diseases depend on the fact, that morbid particles have been sent into the circulation, lithic or other acids may be too abundantly generated, and the first exposure to cold or other disturbing cause will engender disease. It has been well observed that the mere circulation of this acid in our blood disturbs our temper and makes us unhappy, as well as sick. Now this lithic acid as well as other morbid products are sent into the blood, by ill-judged supplies to the stomach. Almost everything that goes wrong with our health has its origin here, we either supply it with

improper materials, or we so overload it that it is incompetent to the task of preparing proper materials for our blood. There are peculiarities in each individual stomach, some have such a tendency to generate acids deleterious to health that the utmost daily vigilance is necessary.

Some people argue that life is made miserable by constant attention to the stomach and its processes. But such continual vigilance soon ceases to be required, as we get into regular habits of taking only such food and drink as we know to agree with us, and this regularity after a time so improves our powers of digestion that occasional deviations from rigid rules does us no harm, that is, provided they are only occasional; should they again become habits of living, we quickly find ourselves becoming too susceptible of all the skyey influences, and other disturbing causes. The real question is, what is the great blessing of life? There are few who would not at once answer good health: and as we cannot enjoy good health without learning how to manage the stomach, this art becomes one of the first duties of life.

The stomach may justly be considered as the grand antagonist to moral and intellectual improvement. Some men of great genius who have been distinguished by their mental productions, have been also indulgent to its false desires; but it is unquestionable that those who gratify overmuch the delight of eating and drinking, do not distinguish themselves in the cultivation of literature and science. Wits and poets are from the very nature of their genius thrown much into convivial society, and are thus led to indulge the stomach to the injury first of their health, and then of the gifts which they have inherited, and the early deaths of these comets of the human race attest the fact and confirm the inference, that indulgence of stomach delights is incompatible with health and longevity. Those great men, who owe their reputation to their own industry and perseverance in the pursuit of knowledge, who not so highly gifted by nature as the former class, the men of great thought of attentive accumulation of the facts of history and science, are more generally long-lived, because their habits of mind lead them to think correctly,

and the result is that estimating the increase of knowledge and the powers of thought beyond all other human enjoyments, they sink sensual gratifications of all kinds more and more as their minds expand, and they are generally rewarded by the comfort and blessing of sound health.

The sensual enjoyments of the stomach are obviously antagonistic to mental and moral improvement in all the classes who make little or no pretence to intellectual pursuits. The man who is rich enough to eat a great dinner daily, and the man who is so poor both socially and mentally as to place before his senses a large meal as the greatest delight of life, are on a par in regard to the real enjoyment of existence, and too often on a par as to their moral and intellectual development. A great dinner is a great curse when of invariable daily recurrence; men may socially partake of the good things of this life occasionally, not only without detriment, but with benefit to their mental advancement; but the daily and invariable custom of overworking the stomach is one of the great evils of life, if not

the greatest. Even a hard-working man who may be out in the open air twelve out of the twenty-four hours, and who, consequently, wears away much of the large amount of what his stomach demands, will be better and stronger, and more able to work if he withstands the temptations of appetite, and occasionally observes some degree of abstinence by diminishing the supplies both of food and drink. The practice of fast-days in the Roman Church has, I have no doubt, been in innumerable instances promotive of health and longevity; and when men cannot do what is right and wise without the authority of a Church such social religious observances may do much good; but in the present day when mere forms of religion are slighted, let us hope because its substantial principles are better understood and acted on, a similar rule on secular authority would be a great blessing to multitudes. Men err more frequently from ignorance than from design in doing things injurious to health. Large supplies of food are almost universally thought advantageous to health and strength, while the amount really

necessary is less than half of what is usually taken. A moderate supply both of food and drink will enable a man to do his work better and easier to himself than a very full one; there is no greater mistake in the proper management of the stomach than to estimate its supply rather by the work we have to do, than by the capabilities and powers of our digestive organs. Many a man has had his working life extended to the latest period from possessing a stomach that objected to over-indulgence. It has been a blessing to numbers to have a stomach easily deranged, so that whenever it has been feasted it has rebelled, and either rejected altogether the delicacies with which it has been charged, or it so deranges the brain and other organs as to unfit its possessor for his daily avocations. Many who in early life are thus taught the evils of stomach enjoyments, have been under the necessity of a more cautious regulation of the supplies, and escape with a temporary fit of indigestion; while others who have had no such warnings, or perhaps who altogether disregarded such admonitions, have become

invalids and dyspeptics for life. Women are much less the victims of indigestion than men because they are less generally the subjects of great dinners, and when in that class of society where the DINNER is the event of the day, the greatest object in life, to be anticipated from early morn, they have more rational resources. Invalids among women are more frequently the victims of their confidence and reliance upon others, than of their sensual indulgences; they are naturally prone to rely too much on their older advisers; and, therefore, the old friend, and the old nurse have undue influence. Drugs, stimulants, and the quackeries called patent medicines too often destroy the digestive power of the one sex, as much as overeating and drinking does that of the other.

The stomach may be compared to a large bag having two openings, one receiving the food from the throat by the process of deglutition or swallowing; the other taking the food after certain changes effected by the stomach into the intestines. By means of certain juices or secretions from the coats or glands of the stomach, the crude food having

been previously prepared by mastication or minute division, becomes very much changed in appearance. Here I may mention the great aid afforded to the digestive process by the minute division of every particle of food by the teeth, and its admixture with the juices secreted by the glands of the mouth. The juices of the stomach are very similar to the saliva of the mouth. Swollen glands about the cheeks and throat are familiar to all, these glands form the saliva. Now all the fluids produced in this way are called secretions, whether the produce of glands or of mucous membranes. The lining coats of the mouth, throat, gullet, windpipe, air cells of the lungs, as well as the inner coats of the stomach and bowels, are all classed under this denomination of "mucous membranes." When these surfaces are irritated from any cause, or when we take cold, the secretions from the surfaces are depraved and increased, hence sorethroats, coughs, &c.

The food having reached the stomach is subjected to great commotion, the particles well mingled together, with copious admixture

of the secretions of the stomach and its glands, until it is prepared for a further process as it passes through the intestines. In the early stage of this passage it meets with the bile, which is the produce or the secretion of the liver, and which plays a most important part in preparing our food for its change into blood. When the stomach, the glands, the liver, and the mucous membranes lining the stomach and bowels are all in a healthy condition, the process of digestion goes on without our knowing anything about it; when we do feel any uneasiness, and our attention is called to the action of the stomach, we may be sure there is something wrong; one or more of the organs concerned in digesting our food are out of order. When the process has been well done, and the food well digested, it is seen to separate into two parts, one a milky juice, we call chyle, being imperfect blood, or the elements of blood, the other a pulpy mass destined, when all that is wanted for the blood is taken from it, to pass into the lower bowels, and rejected together with all useless and worn out matter, received from all parts of the body.

The milky juice, or incipient blood, is taken up by minute vessels opening on the inner coat of the intestinal tube, these pass it on to larger vessels, which carry it into the blood, there to restore the daily loss of blood particles, which are consumed by all living creatures in their daily avocations of motion, sensation, perception, &c. Every action of our bodily organs consuming the blood, and necessitating a constant re-supply. Hence the larger desire for food when by almost living in the open air and taking much exercise, we consume a larger quantity of blood particles. It will be obvious that if any of these delicate processes of digestion are disordered, the fluid separated for admixture with the blood will be depraved, and the early elements of disease generated. When we look at the multitudinous discordant materials with which man supplies his stomach, how far even the most prudent of us depart from the simplicity of Nature; when we know the ignorance, the carelessness with which the stomach is treated, we ought not to be surprised at the innumerable evils of indigestion and their result in the establishment of

organic diseases. When, in addition, we consider the systematic way in which multitudes indulge their appetites, living only, and working only that they may supply not merely their real animal wants, but their many artificial acquired ones. In this respect being less enlightened than the lower animals, who attend to the instincts of their nature, and take only such and so much food as real appetite demands and health requires. When we know that few men are satisfied without that feeling of fulness or repletion, a sure sign we have taken too much food, it is easy to see how the stomach may be the source of many, if not the majority of, human evils.

We cannot express ourselves too dogmatically on this subject, for it is certain that health, happiness, prosperity, and every earthly blessing depends on the process of digestion. If it be well performed, and none but healthy particles sent into the blood, our material and mental organs can do their duties with pleasure; indeed, under the circumstances, all exertions, mental and corporeal,

are attended with absolute pleasure, our moral sense is satisfied that we are in the right path, and our course through life consistent with the Divine laws.

The mind being the part of our nature that we should take pains to develop, this should be begun at a very early period. By giving a child an object to look at, to listen to, or to handle, we are educating the higher senses, and through them the mind; by giving it food or sweets, or satisfying its cries by stomach indulgences of any description, we foster the lower senses, the animal part of us, and instead of developing intelligence we develop sensuality. The tendency of untaught human nature is to cultivate the lower senses; we are prone to please taste and smell in preference to sight or touch; and, therefore, in civilized life, we should take the earliest opportunities of cultivating the moral and intellectual rather than the animal senses. How much of the misery of life is engendered by indulging the stomach instead of the feelings and the intellect; how much better when anything occurs to depress us that we should

stimulate our higher faculties, and find relief from reflection, than drown our feelings and intelligence in things which for a time excite our organic structure, only to be followed by greater depression.

The moral maxims in relation to the management of the stomach are so trite and commonplace it would be superflous to repeat them; that we should eat to live and not live to eat is as old as humanity itself, it would force itself on the mind as one of the earliest results of experience. Like other moral laws it has but little influenced the general practice of mankind, for, if there is one pleasure for which more is sacrificed than any other, it is that of stomach indulgences, and the evil results of these indulgences in the production of disease is only too obvious in the early deaths of the great majority of our race. It is too much the opinion of all classes that diseases are direct inflictions of the Almighty, that they are inevitable, that by no means in our power can we prevent them. Now that all diseases are to be prevented would be to assert too much, but that the majority are is

unquestionable, and, that if diseases cannot be altogether prevented, it is quite in our power to arm the constitution with means greatly to modify as well as to diminish their influence.

I have been asked whether, when the stomach has become deranged by bad management or other cause, it can be restored to health by simple attention to diet and regimen. I have no doubt but that in very many cases it can, but it requires a greater amount of perseverance, and a longer time than most people would have the patience to endure; therefore, in very many cases recourse must be had to medical treatment. It is too much the practice to refer all disorders of the stomach to what is called "bilious," a popular term which includes many different disorders, not only of the stomach but of the liver and of the other organs connected with the process of digestion. The public mind having assumed the character "bilious" to these complaints naturally come to the conclusion that everything "antibilious" must cure them, hence the amazing popularity of the hecatombs of antibilious pills, which are annually swallowed by the Anglo-Saxon race.

Now, as a multitude of cases of indigestion result from over-feeding, much good is done by pills of a purgative character, but as the majority of these remedies contain calomel, and other things which are not universal remedies, many weak stomachs are made worse by the injudicious employment of these drugs. When people find that a domestic or common remedy is not at once successful, it is wise to resort to good medical advice, for it must be clear, that if such powerful things as calomel, aloes, scammony, and colocynth do no good, they may do a very great deal of harm. The tender coats, the mucous membranés of the stomach and bowels, will not bear constant irritation from active purgatives without being in numerous cases made worse by the supposed remedy than by the original disease. Thus many cases of indigestion become complicated by the bad effects of the very means employed for their cure.

I have before said that the question, "How should disease be cured?" is the most important in the whole range of the medical art, whether we consider the ultimate object of

our treatment the cure of the invading disease, or the agent through which our remedies are to be conveyed into the blood to effect such cure. I mean the stomach and digestive organs, for upon these must the primary influence of our agents be spent, whether such means be diet or drugs. So important is it that the digestive organs should do their duty efficiently, that we must be very careful that our agents for the cure of distant disease do not create mischief in that laboratory for the blood, the stomach. If we impede this organ in any degree in its activity towards converting food into blood we may do more harm than good by our remedies. I have said enough to show that in dealing with the stomach as the medium through which all remedies must pass into the blood that much caution is necessary. With proper care, however, there are remedies which act beneficially on the stomach itself when its functions are depraved, and the various tonics, gentian, columba, bark, &c., may be made to act beneficially in combination with the various mineral acids, aided and assisted by the direct in-

fluence on the stomach of such agents as oxide of silver, bismuth, hydrocyanic acid, &c. However, as my object is not to point out the proper remedies for stomach diseases, but rather to show how, if we be wise, we shall do all in our power to prevent the necessity of having recourse to them, by regulating the supplies to this important organ, I shall say no more on this subject but to repeat the caution that all diseases of the digestive organs are not to be cured by that ever-ready remedy, "the antibilious pill."

The products of digestion supply the blood with two most important principles. 1. Heat-making materials to keep up the warmth of the body. 2. Building materials to repair and give strength to the various organs, and re-supply the matter daily used up in the various processes of life, by muscular exercise, &c. The heat of the animal body is maintained at a certain standard, whatever may be the temperature of the climate; at the Poles and at the Equator our internal organs require to be kept at an equal temperature, and this is effected in a great degree by the kind of

food we eat. In hot climates man naturally takes the kind of food which contains the least of the fatty principle, this being the great supporter of animal heat; he lives on vegetable matter chiefly, and the sugar and oil contained is sufficient to keep up his animal heat; but as we approach a northern climate we increase the heat-giving principles of our food, taking a larger and larger quantity of animal food, until we reach the most northern limits of human existence, where the Esquimaux will gorge himself with pure fat in large quantities, as the only means of maintaining a sufficient amount of internal heat to resist the overwhelming cold of perpetual frost.

Besides these two special objects or results for the fulfilment of which particular kinds of food are necessary: 1, to maintain the heat of the body; 2, to keep up the integrity of the various tissues, as bone, muscle, nerve, &c. There is a third class of substances used with food which have been termed accessories. The first class includes fat, starch, sugar; the second, animal food, wheat, oats, beans, &c., or in the language of science, albumen, gela-

tine, gluten; in the third are wine, beer, spirits, tea, coffee, &c. The first class are essential to maintain animal heat, they are literally burned in the body by the aid of the air we breathe, just as a coal or wood fire gives out heat the more liberally we supply atmospheric air. In both cases the results of the combustion are similar: air, in passing through a fire, is decomposed; oxygen, from the air, is absorbed; carbon, from the fuel, is consumed; heat generated, and carbonic acid gas formed. So in the lungs, oxygen is absorbed from the air we breathe, the carbon of fat, sugar, &c., consumed, heat evolved, and carbonic acid gas formed. As a fire will not burn and give out sufficient heat unless we make arrangements for the rapid removal of the products of combustion up the chimney, so the animal fire will not burn well and supply sufficient heat, unless we get rid of carbonic acid gas and other products of the changes which are always going on in the lungs; hence the necessity of ventilation, and that constant re-supply of atmospheric air, without which we cannot enjoy health, be-

cause the air of a close room is soon consumed, and then we breathe the poison of carbonic acid gas instead of the invigorating oxygen, only to be got from a pure atmosphere. The second class of foods are for repairing and re-building the framework of the body, brain, nerves, muscles, bones, and the tissues of our various organs, which are being constantly used up and require to be renewed. Every day, every hour, every minute, some parts of our bodies wear away, every action of our limbs uses up some portion of our tissues which must be replaced, just as every action of a steam-engine uses up some steam, which must be re-supplied by the food of the steam-engine, that is water; exactly analogous to the more solid food we take into our stomach to be converted into that vital fluid, blood, which sets the animal machine going, and educes its motive powers. As water is the moving power of the steam-engine, so is blood the moving power of the animal mechanism.

The third class or accessory matters we take into our stomach are supposed to act only as stimulants to our nerves and brain, but neither

to supply warmth nor add to our structure, they are neither heat giving nor building materials, and are not essential to our existence.

The composition of milk illustrates the proportions in which the warming and building materials are prepared by nature for the nourishment of the young, and will give you a clearer idea of the progress of scientific knowledge in regard to the exigencies of the stomach.

	Water.	Casein.	Sugar	Butter.	Salts.
Human Milk ..	88	3·5	5	3·2	·2
Cow's Milk	86	5·5	3·5	4·5	·4
Goat's Milk	86·2	5·2	4·5	3·78	..

The casein represents the building materials for the support of our locomotive powers, &c., while the sugar and butter represent the materials for maintaining animal heat.

The table shows how remarkably the respective wants of animals are cared for; the human

infant not being required to exert much muscular motion at birth, or for some time after, has food less supplied with the building materials than the calf or the kid, which, especially the latter, are required to use their muscular powers immediately after birth.

As regards the preservation of the stomach from disease, we may divide life into the periods of infancy from birth to 6 or 7 years, youth from 7 to 20, maturity from 20 to 60, age from 60 upwards; but where health has been carefully preserved, we see middle life extended to 70 and even 80. In early infancy the only legitimate food is that supplied by a healthy nurse, and this supply confined to limited and regular periods. A good nurse will restrict the feeding of the youngest infants to once in two hours, and by this regularity prevent that foolish practice of always stopping the cries of an infant by recourse to its food. This is pernicious in several ways, an infant gets more food than requisite to the injury of the nurse: a bad habit is engendered in associating crying and feeding, so that a child is taught that it need only cry and it will be

pacified with food. We may smile at the idea that in this way we begin the false system of recurring to sensual pleasures the moment we are pained by any course, material or mental; but the cultivation of the moral sense cannot be begun too early.

When from circumstances it is necessary to begin to feed an infant partially with artificial food, or when the proper time arrives to relieve the nurse from the entire support of the child, it is wise to begin with the most simple articles of diet. Any pure form of bread or biscuit with sugar and milk constitutes the proper food. In providing milk for children it is a duty we owe them to get it good. Many give up this point as hopeless, but it is not so, there are many dealers in London who sell undiluted milk, unmixed with water, and if people will learn to distinguish good milk they will have no difficulty in getting it. Other adulterations of milk than mere water are rare frauds, and must be confined to the lowest dealers. I only believe in the dilution of milk with water, a most unpardonable practice where a fair price is paid; those who look for cheapness

only must expect to meet with fraud of some kind, either in quantity or quality. If milk will not hang about the sides of a glass or the bowl of a spoon leaving for a few moments a whiteness and thickness adherent to the vessel, it may be condemned as having been diluted. A few trials with real milk and diluted milk will give any person of common sense experience enough to judge of milk by this simple test. This power of distinguishing pure from adulterated articles is of more importance than at first appears—our scientific analyses lead to much knowledge on this subject; but unless the public will act for themselves and learn first to distinguish good articles of food from bad ones, the mere appointment of analysts will go but a small way in relieving consumers, and especially those of poor neighbourhoods from adulterated food. The milk of the infant and the beer of the parents are more extensively diluted and adulterated than any other articles. The remedy is easy, let people determine only to deal with those who supply genuine articles, such dealers are to be found in every locality,

and the number would be greatly increased if the public would be more determined to obtain genuine articles by the acquisition of the necessary knowledge to be able to distinguish these from those which are adulterated.

After a child has been weaned, the staples of its food for a long time should be milk and bread. Half a pint to a pint of real milk is not at all too much for its daily consumption. It is false economy to stint a child in relation to milk. Under the age of 18 months, children require little or no meat, good beef tea may be given occasionally, or the yoke of an egg mixed with their bread and milk once in the day. After the age of two years a child may have animal food twice or thrice a week, and this may be increased as he increases in strength and takes more active exercise. But when we look at the children of the peasantry who rarely have meat more than once a week, it must be obvious that a multitude of children would do as well on vegetable as animal diet. At all ages a smaller amount of meat than is usually consumed would be better for health, and to omit meat from our diet twice in the

week would to most of us be beneficial to health. I am quite sure that if all classes would on two days out of the seven abstain from animal food, and also from fermented drinks, the improvement of the public health would be prodigious. I always take the opportunity of protesting against the invariable daily habit of drinking beer, wine, or spirits: experience is extending a knowledge of the fact that fermented drinks are to the majority of us, not only unnecessary but pernicious; there are few who, if they will try the experiment of a month's abstinence from them, will not find that they can do their work better without than with them. But under all circumstances make water your only drink twice every week, and you will find your health the better. It is the daily and unbroken habit of taking wine or beer that lays the foundation of stomach, liver, and kidney disease, while only an occasional fast would break the chain and prevent the foundation of those and other diseases, which shorten life, and prove my position that the stomach is the source of most of our evils of life.

One very great stomach indulgence even at the earliest age is fraught with considerable evil, and requires notice, I mean the indulgence in sweets. The increase of the shops for the sale of these temptations to the youthful stomach is very much to be lamented. By much indulgence in sweets we ruin our teeth and deprave our stomach.

Many of the foregoing observations apply to adults as well as to children: if we keep guard on the stomach and carefully regulate its proceedings, we may almost insure good health. Even an invalid who observes how his digestive apparatus acts, may greatly alleviate any deranged condition, or even established disease of other organs. It must always be remembered that it is through the stomach that we can alone act on disease, for although there are other modes of introducing a few remedies into the blood, as by the skin, &c., yet we may say, as a rule, that all things that are to act on the blood must pass through the stomach. Now to cure an established disease we must not only operate on the blood by our remedies, but we must rigidly apply the laws in relation to

digestion, in order that the elements of the blood as prepared by the stomach shall be of that healthy character that the particles deposited by the blood all over the body to replace the used up materials, the wear and tear of life, shall be capable of repairing or rebuilding a sound condition of all the organs. In every part of our frame destruction and reconstruction are ever going on, one set of vessels demolish and carry away the worn out particles, while another set of vessels supply the new building materials for repair and regeneration. It is evident that if we could ensure for the act of reconstruction none but healthy particles to replace diseased ones, we should cure a disease without the aid of any special remedy. We may say that all organic disease consists in the deposition from the blood of unsound materials, these materials being introduced into the blood through the stomach. If the mischief produced, if the impaired organ is not in a very diseased state, rigid attention to food and to the healthy action of the organs of digestion, by preventing the intermission of any more of those improper materials which

have already done the mischief, by such means alone will a disease be cured. This explains the grand success which frequently results from the well ordered system of diet and exercise enforced at a hydropathic establishment. Here in making the skin healthy by baths, friction, and exercise, and only allowing the taking of simple and wholesome food, an invalid in a few weeks may be re-established in health, and from being weakly, pale, and cadaverous, may become a sound and healthy man. The enormons influence of the stomach on health cannot be better illustrated, for it happens too generally that as soon as a patient leaves the hydropathic establishment he returns to his old habits, engenders first a series of derangements of his digestive organs, these prepare unhealthy chyle, and the blood is supplied with bad materials. These bad materials reconstruct the various organs with unsound deposits, the old diseases reappear, and unless again checked establish such organic mischief that no art can remove. But let the most confirmed invalid after recovery from disease, however dangerous it

may have been, perseveringly continue to repress the perverted demands of his stomach, keep that organ in a sound state by supplying it with such materials as engender healthy blood, the rebuilding process will be carried on from a sure foundation, and the health of the whole body maintained.

Unless the actions of the stomach are free from disturbance, we cannot command the attention of our thinking powers, our moral sense cannot act without the perturbations of our emotions, and our will. What is called temper has enormous influence in human affairs, and our present temper is often dependant on the present condition of our digestive organs, when a man is in perfect health, he can control all his actions; intellect, emotion, and will, are altogether under due influence, but let a fit of indigestion assail us and all our powers are humbled. Therefore if we wish to advance our intellectual and moral powers, we must acquire knowledge of the physiology of our stomach and digestive organs. It is impossible to separate health of mind from health of body, to think and to feel and to will

correctly, our bodily framework must be in a sound condition. The intellect, the senses, th emotions, are all connected somehow with the structure of the brain and nerves; in this world, in our present condition of being, we could neither feel nor think without a brain; here, our minds are connected with, and dependant on matter; hereafter, they must exist at least without the matter of this globe. Materialism is a bugbear that is called up too frequently, no thinking man can be a materialist, that is, to believe there is no such thing in the world as spirit, soul, or reason; every sense proclaims a spirituality, a something altogether differen from matter. What is sight but an intuitive, a native power, which enables us to comprehend existences external to our own: what is hearing but an innate power given to the material organ of the ear to distinguish and to classify sounds, and moreover to enable our organ of voice to remember and to imitate them. None can deny that we obtain all knowledge external to our minds by the action of the material organism of the senses, the nerves, and the brain; but without the spirit implanted within

us by the Great Architect, that intuitive spirit which must have been transmitted from the Creator to the creature, without this celestial influence our minds would be barren and our souls destitute of those elevating emotions, affections, and conceptions, which redeem the infirmities of our nature, and enable us to look forward with hope and faith for the realization of those aspirations of the future which God in his beneficence has implanted in every human breast.

Now, although we repudiate materialism and pantheism in every form, it is unquestionable that in our present stage of existence our spiritual part is dependant on our material organism, and if this goes wrong our intellect, our moral sense, our volition, may all suffer, and we thus trace the influence of the stomach on our moral and religious welfare. Like all the rest of the body, the brain and nerves are in constant process of decay and reconstruction, their material particles become worn out, and must be constantly renovated; this is done by the building materials sent into the blood from the digestive organs. If we take a proper

quantity of wholesome food and our stomach is in such good condition as to convert the nutritive parts of it into the elements of blood, all goes well through the whole system; but if unwholesome matter is poured into the blood current, the brain and nerves suffer as well as other organs. Again, if the blood circulating in the brain is unhealthy in character, it does not impart to this organ that stimulus which is necessary for the due performance of its duties. If the blood is destitute of those principles necessary for the reproduction of the worn out brain and nerve particles, or if what the vessels deposit in the brain, if the materials with which the brain is repaired are bad, the structure will be incapable of supplying its share in the processes of feeling and of thought. If this reconstruction goes on wrong for some time convulsions, epilepsy, apoplexy, paralysis, and other brain diseases are established. Thus I think the relations and dependence of our mental powers, our moral faculties and affections, and the operation of our will, may be traced from original mismanagement of the stomach, and this ignorance of how to manage

the stomach is equally pernicious to the infant and to the adult brain.

The senses of sight, hearing, and touch are as decidedly instincts in their primary operations as are the instinctive powers of animals. Just as the instincts of animals, making provision for their young, &c., must result from innate power given to their organs by the creative intelligence, so are all the senses of man, internal and external, provided by the same intelligence with innate powers destined to perform their respective offices. So soon as the objects, for which each sense was primarily adapted, are presented, the mind perceives, knows, and remembers such objects, they become established cognitions, and when once fully impressed on the mind are never obliterated. The instincts of animals depend on their organization, and so do the instincts of man, sight, hearing, feeling, &c.: with this very important difference that the instincts of animals are the same throughout their lives, while those of man are improveable by the additional innate powers of attention, understanding, memory, and reason. All these

powers are dependant for their healthy action on the condition of the brain and nervous system, and if we do not keep these in a sound condition, the senses, the memory, and the intellect suffer. Therefore, if we would have sound intellect we must be cautious as to what we put into our stomachs to be converted into brain and nerve tissues. There is a large class of stomach indulgences which generally act on the brain and nerves; wine, beer, spirits, tobacco, tea, coffee, &c.

The respective influence of wine, beer, and spirits on the animal system is very similar, and to a great extent dependant on the amount of pure alcohol they each contain. All kinds of spirits, gin, brandy, whisky, &c., act principally on the brain and nerves: experience has shown in persons who have died from inordinate indulgence in spirits, that the largest amount of alcohol can be obtained from the brain and liver; from all the other structures of the body alcohol is also obtained, but the best authorities consider that undue quantities are always found in these two organs. Experiments have been made on dogs and other

animals, which corroborate these facts, and also that alcohol remains in the living system as alcohol, unchanged by the process of digestion and respiration. Spirits of every kind are eliminated or cast out of the animal body in the same form or condition in which they entered, so that the conclusion arrived at is that they are not food. All food received into the stomach is digested, carried into the lungs there ventilated by the air constantly coming into these organs, and by these processes changed essentially and converted into materials for rebuilding the wearing away structures, or for maintaining animal heat. These are the two grand objects of all food: 1, to repair the tissues of our frame; 2, to keep us warm. For you know, that under whatever climate we dwell, nearly the same internal heat must be maintained. Now, it has been proved that spirits do not contribute to the uses of the animal economy, either in the one way or the other, therefore they are not foods, but are to be looked upon as medicinal agents, like opium and hemlock, acting specifically and medicinally on some of our

organs. Whenever any elementary principle of the food we eat is eliminated, that is, cast out of the system unchanged, it is a sure mark of disease. Two of the most destructive of diseases are connected with the fact of the unchanged discharge from the blood of two elementary principles, albumen in the one, and sugar in the other. Albumen is an elementary principle from which our tissues are repaired. Sugar is an elementary principle which helps to maintain the heat of the body. The two diseases are albuminaria, well known as Dr. Bright's disease of the kidney, because Dr. Bright first detected it, and diabetes, another disease of the kidney, in which unchanged sugar is discharged from within. These and all articles of food, in order to perform, or in course of performing, their duties, are entirely decomposed into the simple elements, carbon, hydrogen, oxygen, and nitrogen, and are in these forms cast out. It is a sign of disease when any substance is eliminated in any other form, if any substance is thrown off by any of our excreting organs in any other form than as simple elements it is a sure sign that some-

thing is wrong within us. When albumen or sugar pass out of us unchanged into nitrogen carbon, &c., we are labouring under disease, or some derangement of the system. This is so well known that any person in whom these disordered processes were taking place would be rejected for life assurance. Alcohol in every form being cast out of the living organism in an unchanged state, must be on these grounds considered as more or less injurious to our healthy organism, and only to be looked upon as a medicinal agent; very useful, indeed, in many diseases, and essential to life in many who have become invalids.

It has also been ascertained with regard to these agents, as well as in relation to tea, coffee, and tobacco, that when supplied in moderate quantities the constitution may be maintained, and a person feel capable of getting through his daily work with a smaller amount of real food than he would require without them. That is to say, if from any cause, privation, or disease, an individual cannot obtain, or cannot eat a sufficient quantity of bread or meat, if he takes some

stimulant his existing amount of strength will be maintained in spite of his diminished supply of staple food, and he will feel himself capable of getting through a greater amount of labour, mental or corporeal, than he could do without them. Hence the value as estimated by the poor both of tea and tobacco, hence in wasting diseases the medicinal value of wine, beer, and spirits.

But to those who can obtain and can digest a sufficient quantity of bread and meat all these stimulants are more or less injurious in proportion to the quantity daily imbibed. The majority of mankind would be better in health and more capable of work without stimulants than with them. I have in my own case tried the experiment over and over again with the same result. I have taken wine or beer for a month, I have abstained altogether from them for another month, and have invariably found my digestive powers increased, my general health improved, and a greater capability of work both mental and corporeal, combined with a feeling of ease, satisfaction, and tranquillity of mind of itself a sufficient reward for

abstinence. I feel quite confident that at least fifty people in a hundred would be better without any fermented drink whatever, and the remaining number with a very much less quantity than they now consume. With regard to tea and coffee, their stimulating quantities are so moderate that it is difficult to indulge in much excess; still there are conditions of the stomach in which tea is peculiarly distressing and must be avoided. The smoking of tobacco has a similar effect to spirits, in those who are short of food, and many old women would rather lose their breakfast than their pipe. Smoking when carried, as it is too often in the present day, to excess is injurious to health both of mind and body, and specially of the mind, it paralyses the action of the nervous matter of the brain and obscures, deadens, and too often stupifies the intellectual and moral powers. All who would retain the full powers of thought, feeling, and will should avoid altogether the idle habit of smoking, at the same time I am ready to admit that I never saw harm done by very moderate indulgence in the smoking of tobacco. I suspect

the truth to be that in adults some indulgence in smoking does no harm whatever, but in youth where probably the brain is more susceptible of narcotic influences, the habit is very pernicious. This opinion is confirmed by the late enquiry instituted by the French government into the extent of smoking carried on by boys and young men in their schools and colleges. It was found that those youths who smoked took a much lower position in all examinations, that all prizes and rewards were almost universally carried off by the non-smokers, and the result has been that smoking has been forbidden in all French educational establishments.

Although there can be no doubt of the fact that indulgence in stimulants enables a person to exist on a smaller portion of real food and gives present satisfaction to the feeling of hunger, yet there is reason to believe that injury is done by the practice to one or other of our internal organs, in which are laid the foundations of organic disease. Among the results of the experiments made on the effects of alcohol on the living tissues, it was found

that a deposition from the blood of fatty matter was one. Now the deposition of fat in unusual places, such as the structure of the heart, the liver, the kidney, &c., constitutes what is called fatty degeneration, and whoever has an organ in this condition holds his life on a very precarious tenure. An ordinary cold on such a constitution will establish an inflammatory or other unhealthy action on an important organ which under these circumstances will frequently end fatally. There is great reason to believe that fatty degeneration is one of the many dangerous consequences of too much indulgence in fermented drinks, and the majority of persons so indulging die before or about the age of sixty. The simple fact of getting fat should be always looked upon with suspicion, means should at once be adopted to prevent it, by studying what we are introducing into our stomachs having this tendency, and correct the habit accordingly.

One often hears of the regrets of persons who are disposed to corpulency, and of the expedients they use to diminish the aptitude to fatten; but I would ask whether any

one ever knew corpulent persons so reduced in circumstances that they had difficulty in obtaining the necessaries of life, retaining their corpulence. No! in such cases you see a gradual diminution of the bulk, and so it would be in any one disposed to get fat, if he or she voluntarily fasted to the same extent as necessity sometimes involuntarily forces on many.

I have endeavoured in a brief manner to show the intimate connection of the state of the stomach with the state of the mind and the moral sense. Very much of our happiness in this world depends on the way we treat the stomach, for I assume that the majority of people can command health, if they will only make themselves acquainted with the leading facts appertaining to the different kinds of food, and the processes of digestion. Such knowledge is within the easy acquisition of all, and when you reflect on the important consequences, the amount of the good and evil of life which hangs upon such knowledge its importance cannot be over-stated. Our business in the present stage of existence is to

develop our intellectual, our moral, and our religious powers, that love for the good the true and the beautiful which is the only genuine foundation of human welfare and happiness, and the better our health the better are we able to do so. If we are always suffering from illness or disorder of any kind, the consequent depression of mind renders us incapable of sufficient mental exertion, therefore at whatever sacrifice in other respects to maintain our health should be one of the primary duties of life, and the maintenance of our health depends upon our treatment of the stomach.

If ignorance is bliss, 'tis folly to be wise. No doubt if the poet's first position is true, the second follows; but not only is ignorance the reverse of bliss, but the parent of all the disasters which afflict the human race. Man was gifted with intelligence to guide him, if he does not cultivate that intelligence he sinks below the level of the brute, and is exposed to evils from which the brute escapes under the guidance of unerring instinct. This argument might be applied to every condition of life, from the statesman who directs the govern-

ment of millions to the lowest classes of those millions, all require intellect and judgment in every stage of human life and progress; but our present business is with only one department of life, and we have to show that unless all men will make themselves somewhat acquainted with the structure of their own frame, they will never be healthy and consequently never arrive at a suitable condition duly to perform the duties of life.

The position assumed is, that some regulative power is required in all animals as to the quantity and quality of the food they eat, without this regulative power they would devour all that came in their way: the brute creatures are guided by instinct in selecting only that kind of provender suited to their mode of life and organisation; but man not having such instinct, must use his intelligence, otherwise he will eat food in quality deleterious and in quantity injurious. Man in every state of society requires judgment to direct him. Children unless watched, will often eat berries tempting to the eye; cases are too frequent when they mistake poison berries for fruit;

but we do not find this done by the young of other animals, they have instincts which prevent it. The conclusion is that it is essential to man's well-being that he should acquire knowledge to guide him even in his choice of food, if he does not, he renders himself liable to disease and misery. Instinct does not tell a child beyond the earliest infancy when it has had enough, its parents must judge for it, until knowledge is required and intellect is sufficiently developed to be its own judge. Look at a boy home from school with an unlimited dinner before him, the quantity he will devour is marvellous, as much as would suffice at least two adults who use their regulative power or judgment. But boys are not the only offenders, observe men at a public dinner and we can only again admire the elastic power of the human stomach. As a general rule all people eat too much, in ordinary life most of us take more food than is necessary, it is only the feeling of fulness or repletion that guides us to discontinue eating, and sooner or later we find out the evil consequences. Some form of indigestion, some

derangement of stomach or liver occurs as a first warning, this first warning to an enlightened intelligence ought to impress future caution and stimulate the judgment to place the stomach under its superintendence. If the judgment is not sufficiently advanced to do this, disease and doctoring become the evils of our whole life.

That the majority of mankind eat and drink more than is absolutely necessary for the due support of health and strength; nay, that the majority of us overload and overtask our organs of digestion, is a fact that few will dispute. Let any one try the experiment for one month, and put himself on a regulated system of diet; I will answer for it that if he carries it out fully he will find himself better able to do his work, be it mental or bodily labour, or the two conjoined, than he ever was in his life. I don't mean to refer every individual evil of life to the stomach, but the origin of a vast number may be traced to imperfect or deranged digestion. How can we be happy and free in mind, or healthy and vigorous in body, if we are frequently, or even

occasionally, invalided by stomach or liver derangement. The thing is seen daily in the youngest children; while their organs of digestion are not disturbed—while the stomach and liver perform their functions with undeviating order, they are strong and happy, their tempers serene, gay, and unclouded. Such is the picture in a family where the laws of health are even moderately observed; for we have within us such an aptitude for the counteraction of mistakes in food, &c., that slight derangements are soon rectified. But observe a family where the laws of health are totally disregarded, where feeding is the one great object of life, where from morning until night the children are always eating, and are taught from the earliest age to prefer wine or beer to water. In such a family, the children at an early age are irritable in temper, disinclined for that perpetual activity which nature dictates to the young, and without which no child can be healthy. In most large towns the mortality among children is enormous; but even in country and healthy districts the proportion of deaths among young children is

greater than it ought to be. Ignorance of the management of children is the great cause of this undue mortality among them, and the principal source of disease is injudicious and over feeding. Observe the dreadful ravages of an epidemic disease in a country village, too often it will more than decimate the children, because from ignorance of the laws of life and health, their constitutions have not been guarded from the ravages of disease by any degree of attention to diet and regimen. We cannot always protect them from the evil influence of climate, but if we keep the stomach in good order by attention to quantity and quality of food, we put them in the best condition to resist attacks of every kind of disorder or disease. In some families you find half, or more than half, the children born have died, while in others the death of a young child is unknown. Endeavour to trace these different results, and you will find in the first, early mismanagement especially in regard to food, in the other the reverse. No doubt, clothing, warmth, ventilation, and good drainage are important laws of health, but a

well regulated stomach is the crowning law of all.

It is remarkable how little food will keep up our strength when we are in good condition, for then our stomach converts every portion of the food we eat into healthy nutriment, while if we are out of condition, the digestive organs can only assimilate small portions of the food we load them with, often too little to maintain the vigour of mind or body. We should never forget that the mind as well as the body suffers from depraved digestion, therefore, if we would have our children fit for the active duties of life, we must attend to their stomachs. It is true we find clever children and adults too with very bad health, but it is a morbid kind of ability, usually eccentric and unsuitable for the ordinary pursuits of life.

My object is not merely a dissertation on the evils of indigestion, but to call attention among other evils to that of over-feeding, of which we are most of us at times guilty; and, with too many it is habitual to eat twice as much as does them good. Moralists tell us that we should not make a pleasure of eating

and drinking; that it will always be a pleasure to eat when we are hungry, is one of the laws of God in nature, but we ought to learn when we have taken enough. One reason why animals rarely take more food than is good for them is that they are not indulged with any great variety, the only animal that delights in every kind of food, and as much as you will give him, is the pig: he like man is an omnivorus animal, and like man when indulged becomes corpulent. When children or adults begin to get over fat their diet should be reformed, for at all ages corpulence should be looked upon as disease, and counteracted by every means that can be devised.

If it were possible to form a statistical table of the quantity of food wasted annually by those who eat more than is necessary it would show an amount sufficient for a large increase of population. Food is wasted by all classes, it is not merely the rich who waste, you will also see it too frequently in the dwellings of the labouring classes. When there is plenty of work, and money is easily earned, it is as easily spent, and most commonly in superfluous

food, the demand increases and prices rise. Some portion of the advanced price of provisions may be ascribed to the unnecessary waste in most households. If only as much food was consumed by a community as was really necessary the prices of all commodities would be beneficially modified.

I must again call your attention to the very important fact, that there are many derangements of health that can be cured without a particle of medicine: when a person has been indulging in rich food, or too much food, mere abstinence will restore the equilibrium. As the majority of our disorders begin with the stomach, so nature cures them by destroying appetite: when a child is taken ill it will eat nothing, the stomach gets rest, and if let alone will come right. But persuade a child to take food under such circumstances and you keep up the irritation until you convert what was only disorder into disease, there is no more frequent mistake than this: children and adults are constantly pressed with food when they would be better without any. If we had the instincts of animals we should eat nothing,

but we have, or ought to have, intelligence to guide us, and we must learn how to act when disease occurs. We might consider it an axiom in the cure of ordinary illness that no mischief ever happens from want of food, while very much evil is induced by pressing it especially on children. There is no doubt that in many simple derangements of health, abstinence, and attention to diet will alone cure them. But here some knowledge is requisite, and we require to exercise judgment in distinguishing such simple disorders from the preliminary symptoms of an important disease. Many a valuable life has been sacrificed by neglect of the early symptoms of disease. In many of the disorders of childhood, such as measles, unless bad symptoms arise, very little medical treatment is necessary, but intelligence is required to say whether such is the case; people must either acquire some knowledge of the human constitution or have recourse to the opinion of those who have, and repose confidence in their opinions. I have always thought that if I had not been a medical man I should not have been

satisfied to pass through life without some medical knowledge, and I believe in a well ordered state of society this will be given as a necessary part of education. The opinion is growing that all should know sufficient of the laws of life and of their constitution, both of mind and body, to guide them amidst the perils to which the health is ever subject. The sanitary movement now so active must lead to this. People are beginning to see the important bearing of health on their own prosperity, on that of their family, on that of society, and of the state. One result of all this must be that many will make themselves acquainted with such general principles of physiology as are necessary to comprehend the ordinary processes of digestion, respiration, and the formation of healthy blood. Many scientific men have already advocated the teachings of physiology in the higher classes of schools and colleges. No innovation would have a more important or more beneficial effect; it would not only teach people how to take care of their health, but it would open to the minds of those who studied it, the most certain means

of advancing intelligence, civilization, and the progress of society towards the good and the true.

The benefits to be diffused by making physiology a part of general education, would be more numerous and extensive than at first sight appears. It is quite clear that no man can take care of a steam engine without having considerable knowledge of its structure and modes of action, the greater his knowledge the better he can preserve it. Now on the same principle, no man can take proper care of the structure and functions of his own organism, without having some knowledge of it, and the greater his knowledge the better will he preserve it. Independent of the knowledge which would teach more how to preserve health, they would have opened to their minds a world of wonderful order, adaptation and contrivance in the minute structure of animals and plants. No study opens and enlarges the mind so much as that of animal and vegetable physiology, no study would be more generally useful. What advantages does it not offer to the engineer, to the agriculturist, to the architect, in fact to

every occupation in life and last not least to the divine. Nothing so enlarges the understanding, elevates the imagination, or completes the intellect and reason, as a knowledge of life and living structures. Every art has been improved by imitation of some of the works of the Creator, and his highest works, the living organisms, have only to be known to suggest to the enlightened mind inventions and improvements that will benefit society at large. We can entertain no doubt, but, that a knowledge of physiology would not only enable men to preserve their health, but would greatly add to their worldly prosperity. I am quite sure that no study so tends to the advancement of all our faculties as physiology, which of course includes mind as well as body.

If physiological knowledge, or the laws of life, were known, we should have fewer invalids and fewer unhealthy children, many a life-long invalid is produced by neglect of the laws of health in the management of the early life of children. Children inherit constitutions and a tendency to certain diseases from their progenitors, certainly of two or three genera-

tions if not more; those therefore who know they are entailing hereditary disease on their offspring should more especially learn how to prevent the propagation of such calamities. I believe a knowledge of physiology among all classes would be the best safeguard to the community for the destruction of hereditary disease. To expect that many who know they inherit diseases of a malignant nature will abstain from marriage, would be to expect an improbability; a few highminded individuals would feel this to be an imperative act of duty, but self-denial of this kind must be ever rare. I am even inclined to believe that such self-sacrifice would be unnecessary if the laws of life were taught as a part of general education, because the development of many hereditary diseases would be prevented in children, if the laws of life and health were understood and carried out, in the whole management and education of such children. How many instances all must know where children born of weakly parents have by judicious training grown up to be fine and healthy specimens of humanity. There is no doubt that by know-

ing how to manage children both physically and morally so as to counteract hereditary tendencies to disease, whether of mind or body, we may eradicate such tendency. We must by food, training, air, and exercise, give vigour to the bodily frame, and by judicious education develop all the faculties of the mind. Bodily and mental occupation are the springs of health, if with these we combine a rigid system of diet we may convert the most weakly born infants into healthy children. Let any one observe the children of vice and pauperism who are now being educated and trained in our district schools, such as that at Hanwell, where 1,200 children of various city parishes, and those of St. Martin-in-the-Fields, are being brought up in active and industrial pursuits. Most of these children have been sadly neglected or mismanaged in their early infancy, fed on the most improper food, ill-clothed, exposed to all vicissitudes of weather, and then stifled in an apartment reeking with the effects of ill-ventilation produced by the breathing of many human beings, perhaps of dogs or other animals, the fumes of coarse

cookery, tobacco, &c. Nothing can be worse than the infancy of most of these children, in some the mischief so engendered is irreparable, but the majority grow up to be healthy and useful members of society, both mental and bodily tendencies to disease being counteracted by living in a healthy country place, in well ventilated rooms, having wholesome food and proper exercise for mind and body. These country district schools for the training of our pauper children are among the best deeds of modern civilization.

The all-powerful argument for the general diffusion of a knowledge of the principles of life and health is the welfare of the community, and if these principles be carried out in the training of children, they must become so universally appreciated as to govern our actions after the period of childhood. Most parents have such an amount of affection for their offspring that they would not knowingly do any thing to injure them, and yet how common it is for parents from sheer ignorance to do many things injurious to the health and happiness of their children. There can be no

happiness either in children or in adults without health; to give health to our children we ought to know something of the laws of life or physiology, therefore it is an imperative duty of all who would promote the happiness of their offspring to learn some of the principles of this science. It would be of infinite importance to the real welfare of the world, if in the competitive and other examinations some knowledge of our own minds and bodies was exacted. Surely it is more important and quite as useful an exercise for the mind to know the laws upon which our real efficiency in life depends—in a word, to know ourselves, than to be able to give the dates of events that have very little influence on the practical welfare of the individual, or the method in which he will be called upon to fulfil the duties of life. It would be no difficult task to prove that some knowledge of physiology will be more useful both to the individual and to the state than any one other subject. The maxim "know thyself." has been the fundamental principle of all philosophers; however they may have differed on other points, however numerous the

sects into which they may be divided, whether their philosophy has been propounded in Asia or in Europe, all agree that to "know thyself, is the essence of all that is valuable in knowledge. Now physiology teaches us this, and it can be learned properly in no other way; axioms and maxims are of little influence unless founded upon some basis accessible to the common mind. Now the basis of all maxims for health and happiness is physiology. Some knowledge of physiology enables us to regulate the actions of our minds and bodies in all their relations to our individual and social welfare. Doctors may give us very good advice on the health of ourselves and families, but such advice generally makes very transient impression, because we know nothing of the basis on which it is founded. In order that such rules of life and health be permanent, we must know something of the machine which we have to regulate. If we would have healthy children we must learn something of the structure and functions of the animal part of our nature; all education has been regulated in relation to the mind, but if the mind is to

be made healthy the body must be first made so, and this can only be done by every one acquiring a knowledge of the structure of his body and the mode of action of some of its organs.

A sound mind in a sound body is the grand desideratum in our present phase of existence, all other possessions may contribute to our welfare, but without these we can have no true enjoyment of life, with them we may really enjoy it without either wealth, grandeur, or rank. A sound mind is more within our own power than a sound body, being corporeally subject to all the skyey influences as well as to the conformations and maladies of our ancestors, disease of body too often assails us without any fault of our own; but our true self, our mind, is more within our power, let us but get full self-possession by the influence of self-knowledge, and we shall not only become the masters of our feelings, our desires, and our passions, but to a great extent of our diseases. We may learn so to govern our body, and control its actions, as to prevent it from leading us into many diseases which in igno-

rance of the laws of health we too frequently fall into.

It is not only in relation to health, although this is the most important object of our present life, that some knowledge of physiology is valuable, but that in every occupation men pursue, such knowledge would be of great value to their successful pursuit. The structure, adaptations, and objects of our senses, and our various organs, are suggestive of ideas useful in every department and pursuit in life. Those who are devoted to mechanical occupations will find in the structure of the animal body contrivances which will be constantly suggesting improvements in the machines they employ. The engineer, the architect, the practical builder will derive from their respective pursuits many hints of value the more deeply they go into the science of physiology. To the agriculturist a knowledge of the structure and agency of the various processes of animal and vegetable life is obviously of the greatest value, indeed, without such knowledge he must be always making mistakes, and with such knowledge he will be able to carry on his

business with greatly increased profit in every point of view. To the artist a knowledge of physiology would prevent the egregious blunders we often see in painting and sculpture. In a word, there is no occupation in life in which some knowledge of physiology is not valuable, and the deeper the knowledge the greater will be the number of suggestions and ideas to be gathered. To the divine in his sublime teachings, what innumerable illustrations of the wisdom, the goodness, the love of God to man, will be found in the structure and physiology of the animal and vegetable world, and more than all in that part of physiology which gives us a knowledge of the human mind. The preacher whose sermons abound in such illustrations will never have to address thin or inattentive audiences.

Much, very much more, might be said of the value of the teaching of physiology in all our schools. Every one would find the advantages of it in the general conduct of life and business, but in relation to health it is imperative, that all who wish for a sound mind in a sound body should study the subject and

learn to know himself. Curious that we should be taught in school knowledge, of languages, numbers, dates, and facts illustrating all sorts of events and persons in all ages of the world, but that the most important knowledge, that of ourselves, should be ignored or left to the chance of being picked up bit by bit, as it generally is in a small degree, by a too late experience. Numerous are the evils which beset us in every stage of life which would be alleviated, and often altogether prevented by a knowledge of physiology. How many infants would be preserved if their bereaved parents had been acquainted with physiology, and had known how best to manage themselves and their offspring. How much anxiety would be spared to parents if they knew enough of the laws of life and health, to give to their children that vigour of constitution which would enable them to resist the inroads of epidemics and the various maladies to which children are liable. How many cases of life-long invalidism might have been prevented by due knowledge of the things to be done and the things to be avoided to make children and youth healthy and

vigorous. Happily the same discipline invigorates both mind and body, and those parents who with common sense can combine the self-knowledge which physiology imparts, to the management of their children, will not only make them healthy in body, but vigorous in mind, and consequently successful in their future career.

If we could avert bodily disease, I cannot repeat it too often, we must learn something of the structure of our bodily organs, and very little knowledge, if it be real knowledge, can be acquired without turning it to practical account in the preservation of health. Who that has learned the important duties performed by the lungs, how essential to health that they should breathe pure and uncontaminated air, will shut himself and his family in an unventilated apartment where the air must become most deleterious to health. It has been estimated that 500 cubic feet of air is the smallest quantity that should be allowed in dwelling-rooms for each person; in the wards of Pentonville prison 900 feet is allowed for each prisoner; in King's College Hospital

2,000 feet to each patient. To find the cubic capacity of a room you have only to multiply the length, breadth, and height. A room 14 feet long, 12 feet broad, and 10 feet high, would therefore contain 1,400 cubic feet of air, and would be a small sleeping-room for two adults, or at most three, or for two adults and two children. To retain health for any length of time in crowded or ill-ventilated rooms is impossible. Who that made himself acquainted with his own mind and its dependance in this world on brain and nerves, would intoxicate that brain, and poison it with gin or brandy—who that knew the delicate structure of these organs of life and mind would not endeavour to preserve them by avoiding excesses of all kinds; for all excesses, eating, drinking, excitement, passion, whatever for a time destroys the equilibrium of mind, tends to disease. To preserve an equal mind, that is to obtain self-possession, is one of the first principles of health; if we give way to passion we over-excite the action of the heart, and no one who is intemperate, and does not learn to control his temper can expect health and

longevity. Too many of those heart diseases which have of late years so much increased, are due to violent passions, to temper, as well as to that overweening love of grandeur, leading men into dangerous speculations so characteristic of this age of enormous wealth and enormous catastrophes, of impoverished aspirants for what has been justly ridiculed as the upholstery and flunkeyism of modern life, the sacrifice of all reality to mere conventionalism. Extremes meet, and the wretchedness of extreme poverty can only be paralleled by the extremes of wealth; great wealth in the possession of an ignorant person, one who has no self-knowledge, is even more productive of misery than great poverty, for experience tells the rich man that it does not exempt him from pain, evil and disease in this world, while its visionary splendours too often prevent him from thinking of another.

Of all detestable doctrines, that which assumes the necessity of so living in these days that it is impossible to avoid doing many things that inevitably injure health, that we are obliged to eat larger dinners than are good for

us—that we are obliged to drink more wine, ale, &c., than does us good—that we cannot help excesses of various kinds—that in the actual conditions of social intercourse we must breathe the contaminated air of crowded assemblies, operas, concert rooms, &c. That these and other contingencies of modern society, which are more or less injurious to health must be submitted to, and a certain amount of dyspepsia, or other derangements, are inevitable accompanyments of high civilization. A new doctrine has lately arisen, that for every deviation of health engendered by absurd habits of business, pleasure, or society there will always be found a specific remedy, and the Turkish bath has been taken up as a means whereby we can counteract the evils engendered by social conventionalisms which are admitted to be contrary to the laws of health. We are told that we may laugh to scorn all laws of health, all attention to diet and regimen, all abstinence, even moderation in eating and drinking may be contemned, because we can fly to the Turkish bath as an infallible remedy for all the excesses which we may

choose to indulge in. The absurdity of such precepts carry with them their antidote, for there cannot be many who will believe that they can continue stomach indulgences, an enormous daily dinner, and a pint or more of wine with no other punishment than an occasional Turkish bath. Ninety cases of indigestion or liver disease out of a hundred are self-inflicted: if we will impose double work on our digestive organs, sooner or later they must give way. The stomach or the liver or both will rebel against the work tried to be imposed on them. The commonplace mode of living, taking daily a full meal of several dishes, wine and beer, with the addition of pie or pudding, cannot be continued unceasingly without stomach or liver derangements; indeed, few do continue even this, which many people would call very simple diet, without such occasional disorder, and we may rest assured that the additional luxury of a Turkish bath, will not prevent the establishment of disease from over indulgence in eating and drinking.

We may with advantage enumerate a few

of the diseases which are most frequently the result of stomach derangements. The whole class of complaints known under the name of dyspepsia, indigestion, bilious, and liver derangemets are among the earliest disorders which are produced by too much indulgence of stomach delights, or too much neglect of the common laws by which the processes of digestion, assimilation, and blood-making are governed. The term assimilation I have abstained from using hitherto, but it is one that expresses so important a part in the conversion of food into blood that it will be useful to say few words on the subject. As soon as the food reaches the stomach assimilation begins, the process is truly to make the beef and bread we eat assume a similarity to the tissues of the animal frame, to be assimilated to those particles of the blood which are carried by the circulating vessels into all the organs and tissues of our frames. Now when we consider the discordant properties of such structures as our brain, nerves, muscular flesh, our lungs, our liver, and the varieties of organic textures of the numerous tissues of the

body we are lost in wonder at the facility with which in health such various processes can go on for a period of seventy, eighty, or ninety years. That during all this time the different parts of our bodies shall preserve their identity in function and power, when in this long period the individual particles composing our tissues shall have been changed an indefinite number of times. It is this change which the process of assimilation is destined to effect. When a person continues to get thin, although taking a fair amount of nourishment; when the body is not properly nourished, we say, he does not assimilate his food. The process of digestion has ceased to effect those changes by which the bread we eat ought to be converted into blood; our tissues are unsupplied with new particles to supply the wear and tear of life, and we get thinner and weaker, unless we can effect a wholesome change in our digestive processes. The term assimilation is therefore most important as expressing the general action of all our digestive organs in the process of blood-making for the reparation of all parts of our framework, to keep up our strength,

and to enable us to enjoy life as a rational creature like man should do. Unless we can properly assimilate our food, unless by such assimilation we can supply the brain, the lungs the liver with blood particles fit for their reparation, unless our blood-vessels can repair our framework as it constantly requires to be repaired, unless as day by day we wear away our brain, our muscles, &c., so day by day we can re-supply the blood with new particles to take place of those which are daily consumed, we cease to enjoy health, and various maladies are engendered.

Now various diseases are engendered by the assimilation of particles from our food which if the laws of digestion were undisturbed by our stomach indulgences could never reach the blood. If we did not supply the stomach with improper materials, either in quality or quantity, many of the diseases which now assail us would be unknown. Travellers in China tell us of the horrible skin diseases to which the poorer classes in that country are liable, from facts stated by all who have seen much of the people of China in their own towns

and villages, we may assume that no people are so much afflicted with loathsome diseases of the skin. We know how dreadfully the enormous population of this country always suffer from difficulty of obtaining sufficient food, and the shifts they resort to in order to supply the stomach with something to act upon. What an European would consider refuse, hardly fit for dogs or pigs, is in China used as ordinary food. Offal of all descriptions, in every degree of putrefaction, is eaten, and the blood assimilates particles so antagonistic to the structure of our tissues that skin diseases especially become almost universal. It is very probable that over-crowding, dirt, bad ventilation, neglect of washing and bathing, &c., &c., may have a great deal to do with the unhealthy skins of the Chinese, but no doubt the wretched food they eat engender these as well as other diseases.

Everybody knows from experience how apt the stomach is to contain acid; now the very juice of this organ requisite for digestion is acid, but when this is superabundant, or when we have supplied an unusual quantity of other

acid matter, such as bad beer or wine is apt to do, we suffer in various ways from sick headache, and other disturbances of the brain, nerves, &c. Nature often cures these conditions, especially in the young, by emptying the stomach and the process of vomiting will often put us right. But when this simple process does not take place various discordant materials are introduced into the blood, and many of our varied ailments are engendered. Thus most of our common complaints begin, the digestive organs have been deranged, our blood being in an impure state, we are subjected to undue cold or heat, to the infection of fever and other malaria, and we become victims to diseases, the influence of which, had our stomachs been in good order, we should have resisted.

That particles of an unhealthy kind are introduced into the system through the stomach is proved by analysis of the blood, urine, &c. Modern science has revealed facts sufficient to settle our minds on this point, and we may rest assured that by due vigilance we may altogether prevent many diseases from entering our blood. The prevention of disease

as I have said before, is of more real importance to our welfare than the cure of disease, because it is more under our own control; by moderate attention to the laws by which our digestive organs perform their work we can prevent the introduction of disease altogether, and when disease has been established a rigid attention to the same laws will prevent the growth of such disease, and very often destroy it altogether.

Not only are bilious complaints, rheumatism, gout, many diseases of the organs of circulation and respiration to be traced to mismanagement of our stomachs, but many of those anomalous conditions known under the phrase "nervous," are equally traceable to misdirection of our digestive organs. Nervous complaints are among the miseries of human life. The low spirits, melancholy, and hypochondriasis, attending them are aggravated by derangements of the stomach and other organs of digestion; and sufferers from these complaints often come to the conclusion that everything disagrees with them to such a degree, that they cease to take any rational food and

almost entirely rely for support on stimulants. Now if there is any class of diseases aggravated by the use of stimulants it is those which are known as nervous. Most patients of this class also take tea in undue quantity, because it seems for the moment to refresh them, but its influence is most pernicious, for in allaying the cravings of the stomach it increases the general mischief by farther disabling the digestive powers. In almost all cases of indigestion tea aggravates the evil by acting as a sedative on the assimilating powers of the stomach thus increasing the debility already existing and eminently promoting that nervousness which makes life itself miserable. This legion of disorders, known as nervous, if to be cured at all must be so by a rigid adherence to a regulated system of diet; all the tinctures of lavender, valerian, &c., all the valerianates of iron, zinc, all the nostrums which these "miserables" have recourse to while allaying momentary distress, keep up the diseases by preventing the stomach from taking or digesting proper articles of food. If we can induce such nervous people to adhere long enough to

diet, air, exercise, rational employment and amusement, we do more for them than can be done by the whole catalogue of drugs and other reputed remedies for nervous disorders. I have therefore again emphatically to assert that nervousness and many other miseries of human life are under our own control, are produced by foolish indulgences in regard to diet, to temper, to idleness, &c., are maintained by the pernicious local effects of stimulants, and can only be cured by bringing the stomach into a healthy condition.

HEALTH AND LONGEVITY.

Ne plus ultra.

In this section I purpose summing up what we can all do for ourselves in perfecting our health and giving ourselves the fairest prospect of longevity. Experience and reflection have led many to the opinion that longevity is little to be desired, how few there are in this world whose experience of life has been such that if they were wise they could

wish any long continuance of it. When age and infirmity settle upon us the sooner we make our exit the better. Experience must admit that there is some truth in this, life is no longer desirable when disease and infirmity wait on age, but the real question is, cannot we so manage ourselves as to extend healthy and vigorous existence to the last day of a long life. I am certain that attention to the laws of health will so invigorate the constitution that human existence may not only be extended, but that it may be made enjoyable by the continuation of mature life into what has been considered old age. Perhaps the best part of human life is when experience has imparted some degree of wisdom into our minds, when our passions and appetites have been reduced to subjection, and our affections and desires are diverted from the glitter and evanescent pleasures which delight our early life, to the mature contemplations of our intellectual and moral nature. Middle or mature life is the soundest and happiest period of existence and it is the business of a sensible person to extend this portion of our being.

Length of years alone, even in combination with health of body, cannot be the true object of human life—unless accompanied with equanimity and mental tranquillity. That period of our earthly pilgrimage may be reached, when we should accept our established position and no longer continue the struggle for rank or wealth which had stimulated the exertions of our more active and ambitious days. We should repose ourselves on the position we have obtained, and make the best of it, calmly awaiting that inexorable doom or rather change of existence, which in the longest life cannot be very distant. To a wise man it must have long been apparent that however we may by prudence lengthen our days, yet with the longest duration we can give them, the real difference between 60 and 80 years is but a mere shred of existence in contemplation of the eternity of mind. If, as must be the case, whether we derive our religious faith from written revelations, or the revelations which teach the same truth in all the works of the infinite, the once existing intelligence is ever existing, that each person-

ality is an eternal personality, what can it matter whether that personality carries on its existence on this earth for a shorter or a longer time. The difference is nothing in the view of eternity. There must, however, be some meaning in the desire for life which actuates all mankind—it must be an affection implanted in our nature for wise and beneficent purposes. There must be a mode of spending the last few years of a long life with advantage, not only to the individual himself, but to the crowds who are to succeed him.

We may assume, therefore, that length of life is a desideratum we are justified in hoping for, and this conclusion warrants us in a full examination of the best means of attaining it with a sound condition both of mind and body.

I shall go through the day's proceedings such as they ought to be in a person who thinks it worth while to attend to the laws of health. There are not many who are willing to carry out such laws; but we should at least know what is our duty in this matter, and no one should be allowed to plead ignorance of what is right in the important concern of the

health of his mind and body. Early rising is universally admitted to be one of the most important items of health: after a good night's rest we should get up soon after we are awake between 6 and 7 o'clock, varying of course a little in accordance with the season of the year. Many of our greatest men have been early risers—Sir Walter Scott was always at his desk very early indeed, he did most of his works in the morning—before the rest of the family had gone through their breakfast, he had composed a large amount of his literary business. There are few who will not find that brain work is best accomplished early in the morning, while the mind is fresh and invigorated by the night's repose; and where any one has got a certain task or business to do in writing, he will find himself a happier man, and thereby accomplish one of the most important laws of health, "to maintain an even temper," if he accomplishes his business work as early in the day as possible.

Of course in describing the proceedings of the day in relation to health, I shall enumerate all that I think is important; but at the same

time I may at once remark that I do not suppose every one will be able to do all that is put down; for example all cannot carry out the process of cold bathing, there are some delicate people with whom it would do harm; but if began and carried out with judgment in relation to season and other circumstances, the great majority of those whom I address would find enormous benefit from the practice.

As soon as we are out of bed, the whole surface of the body should be treated with cold water. It is important to do this while the body retains the heat of the bed and the night's rest, because the greater the amount of warmth we retain the more rapid and efficient is the reaction: it is this reaction which stimulates the circulating system, and gives that glow and comfort felt after cold bathing; without this reaction and feeling of vigour imparted by cold bathing, we may doubt its efficacy. It is this principle of reaction which constitutes the advantages of the Turkish bath, and those who have vigour enough of constitution to have a sufficient reply from the heart and organs of blood circulation, resulting

in that feeling of strength and comfort, which is more easily understood by those who have felt it, than it can be possible to describe: it is I say this principle which shows the benefit of the Turkish Bath as well as of the ordinary cold sponging or plunging bath. The Turkish bath will become a very valuable remedy in many cases of disease; but a daily sponging bath will continue to be not only the most easily available, but really the best kind of bath that can be employed as a means of retaining or improving the general health of the body. This mode of bathing may be modified according to the season of the year and the peculiarities of each individuality. The most moderate way of using it is to dip a towel into cold water and draw it across the back and shoulders, and over all the surface of limbs and body; one two or more dips into the water according to circumstances. A more severe application of this kind of bath is to dip a large piece of sponge into the coldest water the house affords and squeeze it over head, shoulders, back, &c., as long as the amount of water lasts, the patient standing in a tin bath,

on the floor of which is placed a piece of dry flannel.

Now the sooner the bathing process is used after leaving our bed the better, the hotter the body the quicker and more complete is the reaction. It is best not to lie long after the time for rising has arrived, but soon after we are awake to get out of bed and lose no time in taking the bath, because the power of reaction diminishes rapidly from the moment we first throw off sleep. When we first awake the body is more heated than when we have laid awake even a few minutes, and this is the reason why a sponging bath is preferable even to a plunging bath, because being available in the bed-room, even those who have not the luxury of a bath-room can have the benefit of it; and such is the benefit that few who have enjoyed the comfort, health and strength from this kind of bathing will ever relinquish it. Even during the coldest of wintry weather it will become so enjoyable a habit that it ought to be continued unless there be some real objection to its use in cold weather. Those who cannot bear the sponge

may during winter employ only the towel, and it is better to temper the bath with a little warm water than to give it up altogether for so long a period as an English winter.

Having finished the bathing, and dried the body and limbs well with an appropriate towel, the whole surface should be subjected to a quarter-of-an-hour's scrubbing with horse-hair gloves and band, and the duration of the process should not be estimated by guess but by the watch. Every part of the body should be rubbed, and any weak part specially, if the knees or the back are weak, or liable to rheumatic pains, they should have a larger portion of the time than other stronger parts. The benefit derived is not limited to the skin, but the exercise that ought to be used is beneficial to the whole body, and increases that glow of warmth and feeling of strength which the cold bathing has induced. I think a quarter-of-an-hour is the minimum of time that should be devoted to friction of the skin, whoever will adopt it and carry it on persistently (by watch or clock) will never have any skin disease, and the skin from being hard and hidebound will

become supple, smooth, and elastic. Who does not admire the sleek coat of a horse when he has been well groomed, it is the test of health as well as one of the most important points for health preservation. Keep the skin and the stomach sound and we need have no fear for the general health; indeed, the process of friction, and getting the skin into good condition operates indirectly on the digestive organs, increases the appetite, and tends to that vigour of action in the stomach, liver, &c., which results in the formation of such blood, as in its circulation gives power to all our organs.

After bathing and friction, a short walk before breakfast may be indulged in by those with whom it agrees. In regard to health, as well as most other things, no general rules applicable to every individual can be established, to a great extent every one must continue to judge for himself. There are peculiarities in every constitution, which must be most intimately known to its possessor, and every one should so far study his own peculiarities as to be able to adopt such rules as are

beneficial, and reject such as are likely to be injurious in his own special case. As a general rule, early rising immediately followed by cold bathing, and good friction all over the skin will be universally beneficial, yet there are some with whom cold bathing is always injurious, because their powers of reaction are not sufficient to restore the circulation rapidly to the extreme vessels, which by the process have been emptied. However, I should recommend those who cannot apply the cold water not to neglect the friction of the skin, which of itself is one very powerful element in the establishment of a vigorous state of health.

The next subject of attention in regard to health is the supply of food, but I have said so much in a former lecture, that but little now remains. The number and time of our meals is worthy of consideration. Three periods of refreshment are pretty generally adopted, and whether we call them breakfast, dinner, and supper, or breakfast, luncheon, and dinner is a matter of very little moment. Some can do well on two good meals in the day, breakfast and dinner, and this is a good system when well carried out. Those who do

not require food soon after rising, and can make a hearty breakfast with meat or fish, will do very well with only one other substantial meal in the evening. For example, if we take a good meal between nine and ten, we may go on through the day with a biscuit or other simple element in the interval, and dinner in the evening, six or seven or even eight o'clock. To be able to take a substantial breakfast is generally a good sign of health in the stomach and digestive organs, and when only one other real meal is taken, animal food should be one of its elements. The quantity of animal food we require can only be regulated by experience, but I should say that one pound of uncooked meat or fish in twenty-four hours is the full quantity that can be really required by the strongest man. Of cooked meat three to four ounces is enough for breakfast, and six to eight ounces for dinner. However, we all know many very healthy people who take much less.

I think the English custom of tea or coffee for breakfast is preferable to the French system of taking wine, for although the wine usually drank is very light, there is a sufficient

amount of alcohol as to be objectionable in the early part of the day. To those with whom wine agrees and to whom it is a necessity, it may be better, take it in two or three small quantities than in one of a larger kind, but in most cases it is better to limit the drinking of wine to one meal. After breakfast the active life of the day begins, and all who are not by necessity obliged to be active at this time of day should devise artificial means for being so. Between 9 or 10 A.M., to 5 or 6 P.M., exercise in the open air is another most important element of health, no one can enjoy sound health who passes all this time in a sedentary condition. Those occupations which oblige men to be out of doors during the whole of this time are the most to be desired. Five or six hours in the open air is not at all too much for good health; how much more healthy are the inhabitants of large cities who spend a large part of the day in the open air, than the denizens of the most healthy country when too much time is passed in sedentary occupations within doors. Residence in the country is not alone necessary for vigorous health, we ought to spend many hours out of the house.

The amount of exercise taken daily can only be regulated by personal experience, but not a day should be allowed to pass without some exercise in the open air. To those who have long accustomed themselves to a daily walk the confinement of one day is irksome, and the habit becomes so fixed that even wet or snow will not keep them in the house, nor does it do any harm to go out in the worst of weather to those who have accustomed themselves to daily exercise in the open air, for the habit itself has so inured them to changes of temperature and weather that their health is enabled to resist all such vicissitudes. Nevertheless where such conveniences exist it is better to take exercise under a cover of some sort, a barn or shed, in the country, or a covered way or colonnade in a town. In large cities when we study health and comfort more, and sacrifice less to the mere accumulation of wealth, there will be no place without its Crystal Palace, its colonnades, its covered passages and other means of protection from bad weather. What a barbarian act it was to demolish the Quadrant Colonnade, one of the greatest architectural ornaments of London, and one of the few conveniences where

we could get shelter in bad weather, with air and exercise under cover. Such places ought to be encouraged in large cities, and now that we have glass suitable for the roof so as to give sufficient light for the shops, we may look forward to such places as was the Quadrant in London, and the Palais Royal in Paris, will be more common in large cities. I presume that had the thick glass we now have been then in existence the columns of the Quadrant would not have been removed, but unfortunately this act of cockney barbarity was done just before much was known of the availability of glass for roofing. Even Brussels is better off than London for covered ways, our dark and dismal and narrow Burlington Arcade being very inferior to the covered passages of so small a city as Brussels.

Healthy recreation is too much neglected in England. How very small a portion of the money annually wasted in idle and foolish warlike experiments would furnish every town in England with crystal palaces and other suitable places for the improvement of the health both of mind and body. Why enough might be saved yearly in the absurd Government ex-

penditure on printing and stationery, to cover the Mall of St. James's Park with glass, and give to multitudes rational recreation. Surely this would be better than the accumulation of that expensive amount of waste paper called blue books, not one tittle of which ever serves any more useful purpose than to rot in stores, or to make fires of. Why might there not be a moderate sized crystal palace in every one of our parks; can anything be conceived more calculated to civilize our population and promote health and happiness.

How much might be done by the people themselves in the erection of public places for recreation and health, if the system of combination for such purposes was more attended to. While our aristocracy by moderate subscriptions give themselves the luxuries and enjoyments of their club houses, by similar combinations other classes might get parks, playgrounds, conservatories, and other rational means of relief from the smoke, dirt, and confinement of a town life.

For the preservation and improvement of health it is impossible to spend too much time in the open air: next to the soundness of the

stomach and digestive organs, this is the most important item of health, and there is nothing so strengthening to digestion as plenty of exercise in the open air. Nothing less than three hours out of doors daily should be regarded as sufficient by all who wish for health; six hours is better, and those who can afford it can hardly commit an excess on this point. To those who are shut up in offices or shops during the day, two or three hours walking in the evening will do much to counteract the evil of almost any confining and unhealthy employment. There is very good air to be had in the open streets and squares of London, as may be seen by the ruddy faces of many of its inhabitants, whose occupation obliges them to be much in the air. Notwithstanding habits of eating and drinking, not the most perfect: witness the keepers of stalls in markets, porters, cabmen, &c.

Having finished our active work for the day, and taken as much exercise as is necessary for health; we may then make our closing meal, and whether we call it dinner or supper signifies little, so that we make our latest repast three hours at least before bedtime.

Of the quantity and quality of this meal there must be endless varieties, each class of society, each variety of employment and circumstances, age and sex must in some measure modify the solids and liquids which constitute the meal; but it is of less consequence of what the materials consist, as that we should be moderate in the use of them, and it will be unnecessary here to repeat the observations I have made on diet in other parts of my lecture. We should certainly not go to bed with a very full stomach, this is the general rule; but we all know persons who do so, and yet enjoy very good health. The deviations from general rules are usually in people who in other respects observe the laws of health in such matters as early rising and being very much out in the open air. Those who are so fortunately placed as to spend very much time out of the house or the office, can afford with less ill results to neglect some of the other laws of health; but the reverse holds good in the cases of all who are obliged to spend most of their time in houses, offices, or shops.

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